Trend Study 18-23-02

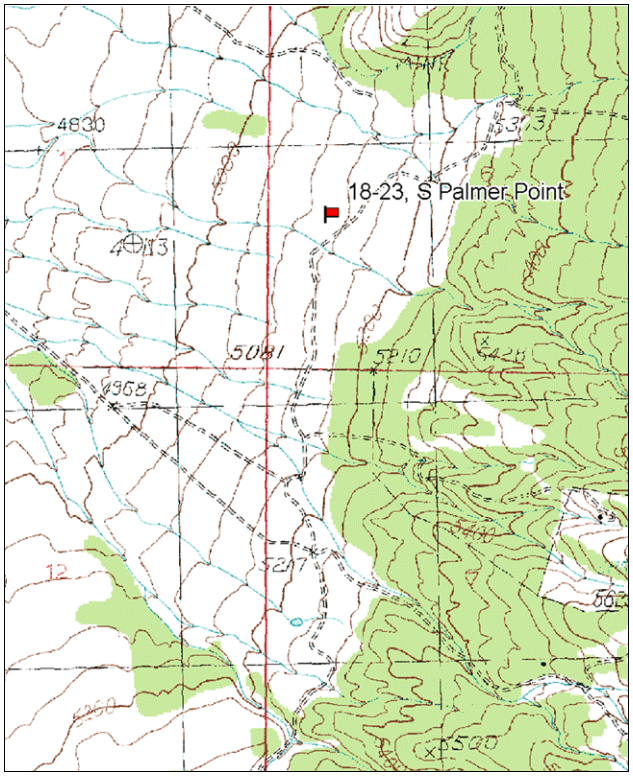
Study site name: South Palmer Point . Vegetation type: Big Sagebrush-Grass .

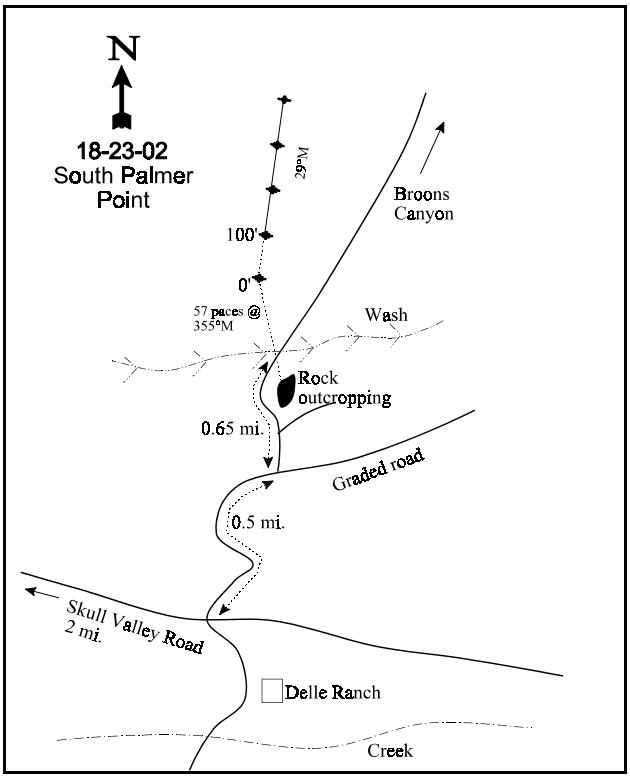
Compass bearing: frequency baseline 14 degrees magnetic.

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

From the site where the creek crosses the road at Delle Ranch, proceed north towards Broons Canyon for 0.05 miles to an intersection. Turn left, and go 0.65 miles until you reach a rock outcropping on the right hand side of the road. From the base of the rock outcropping, walk 57 paces at an azimuth of 355 degrees magnetic (across the road and a dry wash), to the 0-foot baseline stake. The baseline runs at an azimuth of 29 degrees magnetic, and is marked by green steel "T" fenceposts approximately 12 to 19 inches high. The 0-foot baseline stake has a red browse tag, number 3984, attached.





Map Name: Salt Mountain

Diagrammatic Sketch

Township 3S , Range 7W , Section 6

GPS: NAD 27, UTM 12S 4493694 N 357589 E

DISCUSSION

South Palmer Point - Trend Study No. 18-23

The South Palmer Point trend study samples a Wyoming big sagebrush-grass deer winter range. This study was said to be used heavily by wintering deer in the past. The study is on a west aspect with only a slight slope (0-3%) and an elevation of about 5,100 feet. Land management authority is with the Bureau of Land Management. Deer use was judged to be light to moderate in 1997, with some light cattle use also evident. Pellet group transect data from 2002 estimated 23 deer days use/acre (57 ddu/ha). No cattle sign was noted.

Soils are derived from fine textured alluvial deposits with many large rocks on the soil surface. Effective rooting depth is estimated at 14 inches. In 1997, soil temperature was relatively high averaging nearly 72° F at that depth. Parent material consists of a combination of quartzite, limestone, and some conglomerate rock which were alluvially deposited from the canyon to the east. Soil textural analysis indicates it to be a loam with a moderately alkaline reaction (pH 7.9). The high temperature and pH could be limiting to the establishment of some species. The amount of phosphorus in the soil is low at only 3.4 ppm. Values less than 10 ppm could limit establishment and development of some plant species. Cover of bare ground has declined from 30% in 1983 to 17% in 2002. Cryptogams are abundant with its cover increasing from less than 1% in 1983 to 12% in 2002. Vegetative cover consists primarily of cheatgrass brome, Wyoming big sagebrush, broom snakeweed, and scattered Utah juniper. This has not changed much through the years. Protective ground cover is abundant enough to prevent most erosion. The erosion condition class was determined as stable in 2002.

Browse cover comes primarily from two species, Wyoming big sagebrush and Utah juniper. These combined to provide 98% of the browse cover in 1997 and 93% in 2002. Wyoming big sagebrush is the key browse species with a density of 3,820 plants/acre in 2002. Utilization was heavy in 1983 and nearly half of the population was decadent (47%). Use was moderate in 1989 and the number of decadent plants increased to 83% of the population. Population density declined from 2,399 plants/acre in 1983 to 966 plants/acre in 1989. Use was mostly light in 1997 and 2002. The population displayed normal vigor on most plants. Percent decadence declined to about 20% while young recruitment was excellent during both readings (38% and 24%). Dead plants, which were first sampled in 1997, were abundant in 1997 and 2002 indicating that a die-off occurred in the past. The population appears to have bounced back somewhat and displays an upward trend. Vigor was normal on most plants in 2002 and average leader growth was excellent averaging 3.4 inches.

Broom snakeweed and Utah juniper are both increasers with heavy grazing. Total canopy cover of juniper averaged 11% in 2002. Point quarter data estimated 72 trees/acre with an average diameter of 7 inches. Age class analysis indicated a slowly expanding juniper population. Broom snakeweed has a stable population estimated at 2,600 plants/acre in 2002.

The most common grasses are Sandberg bluegrass and cheatgrass brome. However, neither provides much forage. Other grasses occur infrequencly. Cheatgrass is dense enough in most places to create a fire hazard. If a wildfire occurred, it would mean the immediate loss of the sagebrush population. Where the cheatgrass is dense, competition from this winter annual is suppressing the establishment and growth of succulent forbs. The forbs that are present are mostly low growing species of rather poor forage value.

1983 APPARENT TREND ASSESSMENT

Although some sheet and gully erosion is occurring, overall the soil appears basically stable. The dense cheatgrass cover isn't especially effective at preventing runoff, but at least it provides some litter cover. The slope is also gentle which lessens erosion potential. Vegetatively, there are distinct problems. The key browse species, Wyoming big sagebrush, is over-utilized and appears to be in a state of decline. Increasing populations of Utah juniper and broom snakeweed, along with a high fire potential are unfavorable trends.

1989 TREND ASSESSMENT

Trend for soil is stable. Cover of bare soil has declined from 30% to 20%. Herbaceous cover and the lack of any significant slope help mitigate the effects of erosion. The trend for browse, primarily the preferred Wyoming big sagebrush, is down. This is indicated by the increase in the percentage of plants rated with poor vigor, from 47% to 72%. Percent decadence is also increasing from 47% to 83%. The herbaceous understory is slightly up for the perennial component, although there is still too many weedy species in the composition.

TREND ASSESSMENT
soil - stable (3)
browse - downward (1)
herbaceous understory - slightly upward (4)

1997 TREND ASSESSMENT

The trend for soil is slightly improving, with a decrease in percent bare soil (20% to 10%), a significant increase in cryptogamic cover (4% to 10%), and a decrease in percent rock and pavement cover. The trend for the key browse, Wyoming big sagebrush, is up with moderate use declining from 83% to 13%, those plants classified as having poor vigor declining from 72% to 11%, and percent decadence decreasing from 83% to 24%. Also of great importance is that seedling recruitment for sagebrush has increased to 37% and the percentage of young plants in the population has increased to 38%. All measured parameters have improved. The trend for the herbaceous understory is stable. Sum of nested frequency for perennial grasses and forbs has declined slightly but not enough to warrant a downward trend. However, most of the grass and forb cover for this site is derived from annuals and weedy species. Cheatgrass accounts for 50% of the total grass cover and 41% of the total herbaceous cover.

TREND ASSESSMENT
soil - slightly improved (4)
browse - upward (5)
herbaceous understory - stable but poor (3)

2002 TREND ASSESSMENT

Trend for soil is stable. Cover of bare ground has increased slightly and litter cover has declined, but total herbaceous cover has increased slightly and total vegetation cover has remained stable. There is little active erosion occurring on site and the erosion condition class was determined to be stable in 2002. Trend for Wyoming big sagebrush is up slightly. Density has increased 34% since 1997, average vigor has improved, percent decadence has declined to 19%, and young plants remain abundant. Utilization remains light and it appears that deer have not used this area heavily since 1989. Juniper trees appear to be slowly increasing and may warrant treatment in the future. The herbaceous understory is poor and continues to be dominated by cheatgrass, a winter annual. It now provides 58% of the total grass cover and 55% of the total herbaceous cover. Average cover of cheatgrass is estimated at about 13%. The only abundant perennial grass is Sandberg bluegrass which accounts for 36% of the total grass cover. However, it provides little forage. Forbs are fairly diverse but produce less that 2% total cover. The most common species is the annual bur buttercup. Trend for the herbaceous understory is considered stable. Grasses, which account for the majority of the herbaceous cover, have remained at similar frequencies compared to 1997 estimates.

TREND ASSESSMENT
soil - stable (3)
browse - up slightly (4)
herbaceous understory - stable but poor (3)

HERBACEOUS TRENDS --
Herd unit 18 , Study no: 23

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
G	Agropyron spicatum	12	6	11	21	5	2	5	9	.61	.93
G	Aristida purpurea	-	-	-	3	-	-	-	1	-	.03
G	Bromus tectorum (a)	-	-	308	301	-	-	97	93	8.61	12.80
G	Poa secunda	$_{a}$160	$_{b}$244	$_{b}$224	$_{b}$236	63	88	79	80	7.65	7.92
G	Sitanion hystrix	$_{a}$9	$_{b}$31	$_{ab}$21	$_{ab}$10	3	12	11	6	.29	.39
Total for Annual Grasses		0	0	308	301	0	0	97	93	8.61	12.80
Total for Perennial Grasses		181	281	256	270	71	102	95	96	8.56	9.28
Total for Grasses		181	281	564	571	71	102	192	189	17.17	22.09
F	Agoseris glauca	-	-	-	1	-	-	-	1	-	.00
F	Antennaria rosea	12	18	5	6	7	8	3	4	.06	.19
F	Astragalus cibarius	$_{b}$9	$_{b}$12	$_{c}$36	$_{a}$-	8	5	16	-	1.39	-
F	Astragalus utahensis	7	13	15	1	5	6	6	1	.23	.00
F	Castilleja chromosa	3	-	-	-	1	-	-	-	-	-
F	Calochortus nuttallii	11	19	10	4	7	9	6	2	.03	.01
F	Chaenactis douglasii	$_{ab}$1	$_{ab}$4	$_{b}$8	$_{a}$-	1	2	5	-	.02	-
F	Cirsium undulatum	$_{ab}$5	$_{ab}$2	$_{b}$10	$_{a}$-	2	2	7	-	.13	-
F	Comandra pallida	-	-	3	6	-	-	2	2	.01	.03
F	Collinsia parviflora (a)	-	-	4	3	-	-	2	1	.01	.00
F	Cryptantha spp.	-	3	-	-	-	1	-	-	-	-
F	Draba spp. (a)	-	-	-	4	-	-	-	1	-	.00
F	Erodium cicutarium (a)	-	-	$_{a}$1	$_{b}$11	-	-	1	6	.03	.25
F	Holosteum umbellatum (a)	-	-	$_{b}$34	$_{a}$18	-	-	14	8	.31	.09
F	Lathyrus brachycalyx	$_{a}$10	$_{b}$24	$_{a}$-	$_{a}$-	4	8	-	-	-	-
F	Lactuca serriola	$_{a}$-	$_{ab}$7	$_{b}$8	$_{a}$-	-	5	4	-	.04	-
F	Lygodesmia spp.	-	-	3	-	-	-	2	-	.01	-
F	Microsteris gracilis (a)	-	-	1	4	-	-	1	2	.00	.01
F	Phlox longifolia	$_{a}$10	$_{b}$32	$_{ab}$24	$_{ab}$29	4	17	10	12	.25	.16
F	Ranunculus testiculatus (a)	-	-	154	122	-	-	56	44	1.09	.44
F	Tragopogon dubius	-	-	7	-	-	-	3	-	.04	-
F	Zigadenus paniculatus	-	-	1	2	-	-	1	2	.03	.06
Total for Annual Forbs		0	0	194	162	0	0	74	62	1.45	0.80
Total for Perennial Forbs		68	134	130	49	39	63	65	24	2.28	0.47
Total for Forbs		68	134	324	211	39	63	139	86	3.73	1.27

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 18 , Study no: 23

Type	Species	Strip Frequency '97	Strip Frequency '02	Average Cover % '97	Average Cover % '02
B	Artemisia tridentata wyomingensis	66	77	11.78	9.55
B	Chrysothamnus nauseosus albicaulis	1	0	.03	-
B	Chrysothamnus viscidiflorus viscidiflorus	1	0	.00	-
B	Gutierrezia sarothrae	38	45	.34	2.18
B	Juniperus osteosperma	6	9	7.68	8.89
Total for Browse		112	131	19.85	20.63

CANOPY COVER -- LINE INTERCEPT
Herd unit 18 , Study no: 23

Species	Percent Cover '97	Percent Cover '02
Artemisia tridentata wyomingensis	-	9.67
Gutierrezia sarothrae	-	1.42
Juniperus osteosperma	5	10.92

Key Browse Annual Leader Growth
Herd unit 18 , Study no: 23

Species	Average leader growth (in) '02
Artemisia tridentata wyomingensis	3.4

Point-Quarter Tree Data
Herd unit 18 , Study no: 23

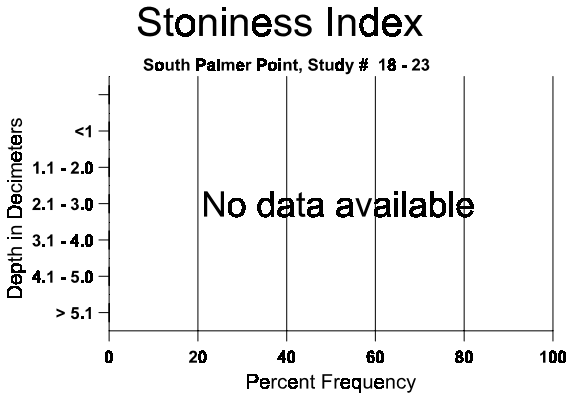
Species	Trees per Acre '02	Average diameter (in) '02
Juniperus osteosperma	72	7.1

BASIC COVER --
Herd unit 18 , Study no: 23

Cover Type	Nested Frequency		Average Cover %			
	'97	'02	'83	'89	'97	'02
Vegetation	354	361	1.50	6.00	39.91	42.34
Rock	89	103	3.25	6.25	2.59	2.93
Pavement	256	257	1.25	10.00	5.13	5.51
Litter	385	367	63.50	53.75	43.77	37.09
Cryptogams	228	236	.25	3.75	10.16	12.06
Bare Ground	218	266	30.25	20.25	10.21	16.87

SOIL ANALYSIS DATA --
Herd Unit 18, Study no: 23, South Palmer Point

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
14	71.6 (14.5)	7.9	42.0	33.1	24.9	2.1	3.4	259.2	0.5



PELLET GROUP FREQUENCY --
Herd unit 18 , Study no: 23

Type	Quadrat Frequency	
	'97	'02
Rabbit	18	3
Deer	16	5
Cattle	2	-

Pellet Transect	
Pellet Groups per Acre '02	Days Use per Acre (ha) '02
-	-
296	23 (56)
-	-

BROWSE CHARACTERISTICS --
Herd unit 18 , Study no: 23

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	83	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	45	-	-	-	-	-	-	-	-	45	-	-	-	940			47
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	89	2	-	-	-	-	-	-	-	-	1	-	1	-	66			2
	97	46	2	-	-	-	-	-	-	-	48	-	-	-	960			48
	02	45	-	-	-	-	-	-	-	-	45	-	-	-	900			45
M	83	-	10	27	-	-	-	-	-	-	37	-	-	-	1233	19	26	37
	89	1	2	-	-	-	-	-	-	-	2	-	1	-	100	39	29	3
	97	40	9	-	-	-	-	-	-	-	47	-	2	-	980	28	45	49
	02	101	7	-	2	-	-	-	-	-	110	-	-	-	2200	21	31	110
D	83	-	11	23	-	-	-	-	-	-	-	-	34	-	1133			34
	89	2	22	-	-	-	-	-	-	-	5	-	19	-	800			24
	97	16	6	-	2	-	-	-	-	-	12	-	1	11	600			30
	02	32	2	-	2	-	-	-	-	-	19	3	1	13	720			36
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	2080			104
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	1560			78

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	29%	69%	47%	-60%
'89	83%	00%	72%	+62%
'97	13%	00%	11%	+34%
'02	05%	00%	07%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	2399	Dec:	47%
	'89	966		83%
	'97	2540		24%
	'02	3820		19%

Chrysothamnus nauseosus albicaulis																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20	15	18	1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'97	20		-
	'02	0		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus viscidiflorus																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0	6	5	0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	0	Dec:		-
'89	0			-
'97	20			-
'02	0			-

Gutierrezia sarothrae																		
S	83	59	-	-	-	-	-	-	-	-	59	-	-	-	1966			59
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	97	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	38	-	-	-	-	-	-	-	-	38	-	-	-	1266			38
	89	23	-	-	-	-	-	-	-	-	22	-	1	-	766			23
	97	34	4	-	-	-	-	-	-	-	38	-	-	-	760			38
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	58	-	-	-	-	-	-	-	-	58	-	-	-	1933	9	11	58
	89	88	-	-	-	-	-	-	-	-	87	-	1	-	2933	13	14	88
	97	88	-	-	-	-	-	-	-	-	88	-	-	-	1760	7	6	88
	02	92	-	-	-	-	-	-	-	-	92	-	-	-	1840	8	11	92
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	-	-	-	-	-	-	-	-	-	1	-	33			1
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	37	-	-	-	-	-	-	-	-	29	-	-	8	740			37
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	800			40

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+14%
'89	00%	00%	03%	-32%
'97	03%	00%	00%	+ 3%
'02	00%	00%	06%	

Total Plants/Acre (excluding Dead & Seedlings)			
'83	3199	Dec:	0%
'89	3732		1%
'97	2520		0%
'02	2600		28%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
S	83	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
Y	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	89	6	-	-	-	-	-	-	-	-	6	-	-	-	200			6
	97	-	-	-	1	-	-	-	-	-	1	-	-	-	20			1
	02	3	-	-	-	-	-	-	-	-	3	-	-	-	60			3
M	83	2	-	-	2	-	-	-	-	-	4	-	-	-	133	62	44	4
	89	-	-	-	2	-	-	-	-	-	2	-	-	-	66	335	118	2
	97	5	-	-	-	-	-	-	-	-	5	-	-	-	100	-	-	5
	02	5	-	-	-	-	-	2	-	-	7	-	-	-	140	-	-	7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+38%
'89	00%	00%	00%	-55%
'97	00%	00%	00%	+40%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	166	Dec:	-
	'89	266		-
	'97	120		-
	'02	200		-